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STUDY PROJECT

THE TANK IS DEAD -- LONG LIVE THE TANK

BY

LIEUTENANT COLONEL JOHN CRADDOCK
United States Army

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Since its development and introduction, the tank has dominated land warfare. Numerous attempts to neutralize or limit its effectiveness have been tried. Largely, these efforts have focused on a technology approach -- the tank attained a "measure" of capability, and an "antitank" countermeasure followed. This approach has not been successful because the tank also developed, thus offsetting the desired antitank advantage. Today's challenge to the tank comes from a different direction. With the end of the Cold War and the demise of the Soviet Union, many believe the era of the tank is over. The wars and conflicts this nation faces in the future will not require heavy armor. They contend that even if armor is needed, this nation does not have the ability to rapidly deploy that force, rendering it incapable of accomplishing its crisis response mission. On the other hand, there are those who believe the tank still has great utility. The world is still a dangerous place, with many potential adversaries owning large armor arsenals. For conventional force deterrence to be viable, heavy armor forces are essential. This study examines the arguments of both groups and

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USAWC MILITARY STUDIES PROGRAM PAPER

THE TANK IS DEAD -- LONG LIVE THE TANK

AN INDIVIDUAL STUDY PROJECT

by

Lieutenant Colonel John Craddock
United States Army

Colonel Douglas W. Craft
Project Advisor

U.S. Army War College
Carlisle Barracks, Pennsylvania 17013

ABSTRACT

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INTRODUCTION

Since the initial development of the "tank," now known as the main battle tank, its efficacy has come under scrutiny. The cyclical nature of this debate is curious. Sometimes the catalyst for argument was technological change, while at other times the focus was tactics and, to some extent, strategy. Regardless, a peace-conflict-peace cycle evolved. As it happened, consensus was reached concerning main battle tank utility during peacetime. Then, when a conflict occurred, the post-conflict investigation and analysis led to new postulates regarding the tank's value or merely confirmed previous beliefs.

The purpose of this paper is to explore main battle tank utility in today's world. To that end, it is beneficial to review briefly the tank's history. What has transpired in the argument and counterargument of "is the tank dead?" Following that perspective, the focus is on the current environment. What changes in the post-Cold War world impact upon the usefulness of the main battle tank -- national security strategy, the nature of conflict, technology, etc.? By design, the tank utility assessment excludes cost factors. The correlation of cost and performance factors exceeds the scope of this study. A section of final thoughts will attempt to draw some conclusions from earlier analysis.

THE TANK IS DEAD

The tank was born in World War I. Its purpose was to restore mobility to battle by providing an armored gun platform from which gun crews could destroy machinegun positions unencumbered by wire and trenches, protected from small arms and artillery fragments. In operational concept, it was a weapon to support the advance of dismounted infantry.[1] As a result of tank use in World War I, first impressions became lasting impressions -- tanks were tied down to the infantry's rate of advance. As Liddell Hart commented, "the conclusion was logical but the consequences proved lamentable."[2]

As a result of WWI experience, the issue facing the armies of the 1920's and 1930's was not one of tank utility, but a question of how best to employ the tank's substantial capabilities. A dichotomy evolved during these interwar years with regard to the tank's best use: those who favored the enhancement of weaponry and those who favored survivability against weaponry, offense versus defense, blitzkrieg versus sitzkrieg.[3] During this period the argument elevated armored warfare from a tactical novelty to an operational weapon of incredible potential by the time war broke out again.[4]

Virtually the entire world adopted the "tanks accompany infantry" theory by the late 1930's. The Americans, Russians, and French rushed to copy the British by setting up tank-heavy

formations to replace the old horse cavalry in its familiar limited role. The French moved by a slightly different path in roughly the same direction. They relied on forts and antitank guns to do to the German tanks what the machinegun had done to World War I infantry.[5]

But what of the Germans? There were significant differences between the views of the Germans (i.e., Guderian) and those of the British (i.e., Liddell Hart and J.F.C. Fuller). Additionally, the Germans acknowledged the beginnings of a debate concerning tank and antitank operations. In his book Panzer Leader, Guderian describes the ideas he put forward in October 1937 defining the philosophy of the German tankmen. Guderian said the tank was the "best means available for a land attack." This was so in spite of the struggle for mastery between the antitank gun and tank armor, which Guderian recognized as simply the norm of history applying itself to modern military technology, and no reason to abandon the tank.[6]

As the Second World War ended, armored warfare achieved prominence in the field of land combat. In fact, armored warfare was the norm, rather than the exception, whether talking of blitzkrieg style offense or defense-in-depth using mobile forces.[7] Buoyed by their preeminence on the ground battlefield, tank proponents sought to quickly consolidate their gains by advocating full mechanization of the remaining combat arms.

Challenges to those claims arose. Many believed the reign of the tank, the armored force, ended with the introduction of

atomic weapons at the close of World War II. That, combined with the advent of new, very capable antitank rockets, provided strong arguments for these advocates. One result of this debate was the U.S. Army decision not to put medium tanks into the Far East until after the Soviet-made medium tanks (T-34's), too powerful for U.S. Army antitank weapons and light tanks, almost drove U.S. and Korean forces into the ocean in 1950.[8] Realistically, however, the Korean War did not offer any outstanding lessons for the evolution of armored warfare.

Throughout the 1950's, the panacea for national defense was the nation's reliance on nuclear weapons. Accordingly, the strategic arms programs received the highest budgetary priority, while ground combat forces the lowest. Although debate ensued concerning the tank's viability on the nuclear battlefield, no technological innovation arose to challenge its dominance in land combat. On balance, the nuclear era clearly demoted the tank from its preeminence during World War II -- the "ultimate weapon" whose employment determined the military balance of power on the European continent -- to a position of secondary importance.[9] In the 1960's, while the Soviet Union was analyzing and modernizing its tank fleet, American focus was on the rapidly escalating war in Vietnam. The Army learned much from that conflict, but little of it applied to tank warfare. Tank use was restricted to a narrow range of functions, few of which resulted in the transfer of lessons-learned to the plains of Europe.[10]

It was in the late 1960's and early 1970's that a number of technological improvements in antitank weaponry began to reach armies around the world. Prior to this, the first weapon to seriously threaten the tank was the antitank gun. Initially, these could engage and destroy tanks at ranges beyond that of the tank gun. At this point the antitank guided missile (ATGM) replaced the antitank gun in the evolutionary measure/countermeasure process. Additionally, significant advances in high-explosive shaped-charge technology yielded very capable, inexpensive short range antitank rockets.[11]

The "death of the tank" began to be a topic of discussion in military circles during this period. Curious is the degree to which this theme was a topic of conversation within the Armor community. According to an article by a military officer in Armor magazine:

> The tank of today is as anachronistic as medieval body armor. Though it has many obvious advantages, it has evolved to the stage of imminent extinction because it has become increasingly inefficient in an age which demands more of machines than ever before. It has become the Juggernaut of modern military technology, demanding high capital outlay and enormous logistical support and not much more effective than that of the lone enemy guerilla who destroys the tank with a well-placed rocket.[12]

The Vietnam War provided a portent of ATGM capability several months before the 1973 Arab-Israeli conflict. In early 1973, both North Vietnamese and U.S. forces employed state-of-the-art ATGM's against tanks. The results demonstrated the

effectiveness of the shaped-charge warhead. The U.S. engagement was from a helicopter platform -- a first.[13]

Just a few months later, the Yom Kippur War yielded the same ATGM lesson, though on a far larger scale. Unlike Vietnam, where the dialogue occurred largely within U.S. military circles, this Arab-Israeli conflict evoked debate on the international scene. Was tank dominance over? The debate in the Soviet Union was particularly intense, occupying agendas of important Soviet military conferences during the two years following the war.[14] The Soviets concluded that ATGM's increased tank vulnerability. As a result, they advocated suppression of ATGM's to reduce that weakness.

Since the mid 1970's, the argument continues throughout the international military community. A consistent improvement in antitank technology prevailed -- 2nd generation ATGM's, enhanced kinetic energy tank ammunition, vastly improved antitank mines, antitank artillery rounds, and air-delivered precision guided munitions. All were used against tanks with varying degrees of success at some time during this period. It appears the technology contributing to methods of killing the tank advanced faster than the technology contributing to its survivability.[15]

Challenges to tank dominance of land combat can be best measured in terms of what did not happen. The tank, through technological improvements in survivability, withstood the onslaught of the myriad of antitank systems posed against it

since its rite of passage at the Somme in 1916. The main battle tank retained preeminence in the land combat arena throughout the Cold War era.

A review of tank history is not complete without mention of the last great conflict, Operation Desert Storm. One must analyze this conflict carefully. There are few meaningful new lessons from the land campaign that concluded the war. There is a bottom line concerning the tank issue. In all cases of Iraqi fire -- tank gun and antitank -- there was no penetration of the crew compartment, no casualties, and no irreparable damage to U.S. tanks.[16] In the tank/armor force world, this indicates a quantum leap in armor protection technology, swinging the pendulum from firepower to survivability.

Tank history can be summarized by making two points. While Commanding General of the United States Army Armor Center, then Major General Donn A. Starry well stated the first point. He said modern war is a contest of measures and countermeasures. For every modern weapon system, there is an effective countersystem; for tanks, there are other tanks and ATGM's. He compares the process to the children's game of "rock, scissors, and paper". Rock breaks scissors, which cut paper, which, in turn, covers rock. The goal in battle is to apply the tactic which best utilizes the capabilities of each system while minimizing its vulnerability to countermeasures.[17]

The second point is the presence of a constant threat over the past 10 years. The Axis Powers were the WWII threat. The

bipolar Cold War began around 1947. Thus, the Soviet Union's robust armored force provided the rationale for continued tank development and increasing inventories. Up to the end of the Cold War, there was never an issue of having or using tanks. Tanks were necessary because of the combined arms mandate -- the need for mobility to seize the initiative.

Thus, having reviewed where the tank has been and the challenges to date, it is appropriate to look now at the current situation -- change and the implication of that change.

A WHOLE NEW WORLD -- AND STRATEGY

Today's world is more complex and challenging than the Cold War world. Although the fall of communism and the subsequent breakup of the Soviet Union are positive events, a high degree of uncertainty exists. The world is still a dangerous place. The rise of new economic centers of influence, new political organizations, and new regional military powers may presage competition for scarce resources or territory. Uneven economic development will prolong poverty throughout many parts of the globe, promoting terrorism and malignant drug-based economies. Traditional national and ethnic enmities will sustain the demand for both high and low technology weaponry, further retarding economic development while raising the costs of conflict.[18] The result is uncertainty and risk.

The making of a national security strategy requires an understanding of the forces at work in the world today -- the changes and constants, the certainties and risks. The United States' interests for this decade are: (1) The survival of the United States as a free and independent nation, with its fundamental values intact and its institutions and people secure; (2) A healthy and growing U.S. economy to ensure opportunity for individual prosperity and resources for national endeavors at home and abroad; (3) Healthy, cooperative, and politically vigorous relations with allies and friendly nations; and, (4) A stable and secure world, where political and economic freedom, human rights and democratic institutions flourish.[19] These interests have sometimes been at odds with interests of other nations or groups of nations. When political accommodation fails, U.S. military force is an option available to protect these interests.

The fundamental objective of America's armed forces is constant: to deter aggression and, should deterrence fail, to defend the nation's vital interests against any potential foe.[20] Accordingly, the National Military Strategy is built on four foundations. The first is strategic deterrence and defense. Even with recent substantive nuclear weapon reduction agreements, many warheads remain. Political instability in the former Soviet Union, where thousands of nuclear weapons remain, is a cause of great concern. This fact, and the proliferation of weapons of

mass destruction, results in the mandate of a credible strategic deterrence.

The second foundation is forward presence. As the total number of American military forces stationed overseas declines, forward positioning of many forces transitions to forward presence of fewer forces.

The third foundation is the key demand of the strategy -- crisis response. U.S. forces must respond to any region of the world to deter and, if necessary, fight unilaterally or as part of a combined effort. This capability is the linchpin of the new strategy.

Last is reconstitution. This is the capacity to expand the nation's warfighting capability by mobilization and activation of the industrial base on a large scale.[21]

What does all this mean? How does this military strategy compare to the past strategy? Forward presence has been a cornerstone of U.S. strategy for years, both in terms of selected forces stationed in critical areas around the world and operationally ready military equipment stored at sea and on land outside the United States. The same can be said for strategic deterrence -- as long as nuclear devices remain in the hands of potential adversaries, this foundation stands. Reconstitution has always been an element of U.S. military strategy. Reliance on reconstitution ebbs and flows in direct proportion to the attendant reduction and buildup of the nation's standing armed forces. Lastly, crisis response has been a part of the strategy

to a lesser extent for years. Crisis response has been used several times over the past 20 years, most recently in Grenada, Panama, and Saudi Arabia.[22]

As stated previously, the end of the Cold War does not mean a lessening of the probability of conflict. Since World War II and before the Persian Gulf War, 125 wars have caused 40 million deaths. These wars were not the result of ideological differences between East and West, but of age-old causes of war -- boundary disputes, economic conflicts, and ethnic tensions. The end of the Cold War does not eliminate these sources of conflict; it may even exacerbate them.[23]

Threats to U.S. national interests exist. With the ever changing and interrelated world environment, precise definitions are difficult. What is the military capacity of these threats? How do these threats relate to conventional U.S. force capability?

With the likelihood of direct U.S./former Soviet Union confrontation presently extremely low, operations in the Third World logically move up in priority. Crises in the Third World are inherently unpredictable and subject to rapid escalation. The Korean War and Vietnam are evidence of this.[24] Although none of the nations that own the 10 largest military forces in the world are currently active enemies of the United States, there is potential for conflict between and among several of them.[25] Additionally, many nations spend high percentages of their gross national product (GNP) on military equipment.

With the transfer of conventional weapons increasing at a tremendous rate, the term "low-intensity conflict" is almost a misnomer.[26] According to former Department of Defense Under Secretary Paul Wolfowitz, "potential adversaries in the Third World are no longer trivial military problems." At least 20 Third world armies possess more than 1,000 tanks.[27] Additionally, at least 56 countries possess two of the following weaponry packages: 700 armored combat systems (tanks or infantry fighting vehicle equivalents), 500 artillery pieces, 100 combat aircraft, and/or more than 100,000 soldiers.[28]

The proliferation of modern weapon systems in the Third World enables many small countries to assemble powerful armored and air forces, far beyond the need for such forces given the size of their theaters or any reasonable local objectives.[29] Thus, regional states have within their control the means of escalating or widening the pace and scope of conflict. Weapons systems possessing firepower and other capabilities usually associated with a heavy division structure are replacing low-intensity capabilities in many lesser-developed countries of the world.[30]

TANKS AND THE CURRENT WISDOM

As stated in the previous section, change is rampant. In the ends, ways, and means triad of strategy formulation, the problem, simply stated, is: What should the Army look like to face the future? Are tanks and heavy armor viable in the crisis

response/force projection component of the national military strategy? Yesterday's paradigms do not apply to tomorrow's issues. According to General (Ret.) Donn Starry:"We have a notorious record in this country for summing up our military adventures and misadventures by preparing to do the whole thing over again, only better".[31]

Two schools of thought prevail in the current wisdom. The first holds that the heyday of the tank -- heavy armor -- is over. The evolutionary, and maybe revolutionary, change in the world environment, the nation's security strategy, and advances in weapons' technology make the tank obsolete. The other school is the opposite view. Its advocates purport heavy armor, the tank, as increasingly viable. It holds the tank's enduring characteristics and capabilities remain applicable on future battlefields. This study will investigate the arguments, beginning with the former school -- the tank is obsolete. For the sake of simplicity, this point of view is the "naysayers".

THE NAYSAYERS

The naysayers contend the current U.S. military force structure and composition reflect the strategic assumptions of the Cold War. They hold that forces and capabilities required for future conflict resolution must result from potential threats to national interests.[32] Their position breaks into five categories of argument: the nature of future conflict; the

shortfall of strategic lift in support of crisis response operations; the supportability or sustainability of an employed heavy force; the tremendous advance in antitank weapons and precision guided weapons technology; and, the viability of tank surrogates, i.e., a light tank. The following paragraphs address each of these arguments.

Naysayers contend that the nature of conflict is changing. The conditions that will predominate in the 21st century will reflect many potential adversaries rather than a single foe requiring a narrow focus of contingencies.[33] Many argue the Persian Gulf War was the last conflict of the Cold War. They believe it was won by a military equipped and trained to defeat a Soviet attack on Western Europe.

Armies, like any conservative institution, tend to persist in things they appreciate and to dismiss unpleasant interim experiences as aberrations.[34] In that light, the naysayers contend the U.S. Army's brilliantly successful Gulf War was but a final echo of the Third Army's great wheel across France. To meet future challenges, they say the U.S. Army must turn from the warm and well-deserved glow of its Persian Gulf victory and embrace, once more, the real business of infantry soldiers -- the "regulars".[35] Thus the thesis: this nation's capacity for conventional warfare will discourage potential foes from that strategy. Instead, foes will resort to other methods and forms of warfare -- low-intensity conflict, terrorism, banditry, etc. -- not suitable for tank warfare of the mid-intensity conventional

mode, but for the "regulars", the infantry soldiers. Proponents of this point of view argue the nation's real fighting component -- the light infantry soldier -- is never at peace, only in-between engagements, much like his ancestors in the intermittent Indian campaigns.[36]

But what if a foe were either ill-informed or bold enough to challenge the United States in a conventional mid-intensity conflict? What is the naysayer response?

It is that the Army's heavy force -- the main battle tanks and the infantry fighting vehicles -- are superb systems. In concert with supporting systems and services, they can prosecute sustained combat on land to defeat enemy land forces and to seize, occupy, and defend land areas.[37] They argue, however, that since regional conflicts occur where forces are not forward positioned, this powerful central reserve is worthless because it cannot get to the vital point in time. To move a single armored division by strategic airlift requires 2500 C5 and C141 sorties, or if by sea, requires the entire Fast Sealift Ship fleet currently in service.[38] That is the second argument posited -- the paucity of strategic air and sealift which puts finite limits on what forces participate.

How severe is the strategic lift shortfall? In absolute terms, it is very severe. Although articulation of the specific shortfall is beyond the scope of this study, some relative numbers point out the issue. Just to move an airborne division to the Middle East requires at least three and one-half times the

C141 inventory of the Air Force. The critical factor, however, is not when the first aircraft gets to its destination, but when the last one arrives.[39] The inevitable result is incremental force closure -- a piecemeal deployment of forces in packages that may not be capable of security, let alone sustainment, until the entire force closes its destination.

The third area of naysayer concern is sustainment -- the support of the force once it deploys. Critics contend the U.S. Army lacks armored and mechanized expeditionary forces that are tailored for power projection, fully combat ready, and self-sustainable. Additionally, overdependence on Reserve and National Guard combat service support and logistics units presents a critical problem in scenarios requiring immediate deployment.[40] Regional conflict may likely occur in Third World nations which lack developed infrastructure and substantive host nation support capacity. Both are important ingredients in building support systems for heavy forces. Shortfalls in either mandate the requirement to deploy additional logistics resources to compensate, thus offering more competition for the already scarce lift assets.

The fourth contributor to tank obsolescence, according to the naysayers, is the remarkable proliferation and lethality of antitank weapons. Tank proponents claim the psychological value of the tank is important. The naysayers argue this shock value was much greater against an enemy with no antitank weapons, and moreover, shock effect is a two-edged weapon. They believe the

sight of an advancing enemy tank to an infantry tank hunter is probably not as shocking as the sight of a burning tank to the commander of the next tank in line.[41]

As every new tank weapon appeared, it spelled the end for the tank. This trend continues today. The reason this never brought the tank to its end in the past was because the new weapon's success depended on the tank remaining unchanged. Tanks never did. New tanks developed or old ones improved to offset the supposed advantage.[42] The naysayers hold that this trend is over due to significant technological advances in antitank weaponry.

They further argue that antitank weapons are increasingly driving tank design and tactics to saturation. There are fewer and fewer things tanks can do to counter the antitank threat. A moment's glance at the variety, numbers, and effectiveness of existing and planned antitank systems gives pause for concern.[43] Currently deployed Western block systems include some 13 different series of antitank mines from six countries, 13 surface-to-surface ATGMs also from six countries, and U.S. produced air-to-surface ATGMs (Hellfire and Maverick) and the cannon delivered Copperhead. Those same Western nations also have significant antitank systems in development: six new series of mines, five surface-to-surface ATGMs, four air-to-surface ATGMs, five cannon-delivered antitank munitions, and a new family of mortar-delivered antitank munitions.[44] Additionally, improved munitions for the Army Tactical Missile System (ATACMS) are in

development, using "smart" anti-armor submunitions to top-attack armor formations.

While many consider the current generation of antitank weapons inadequate due to new forms of armor, the new "top-attack" approach presents many problems for the tanks. Either missiles or munitions overfly the battlefield, find targets via sensors, then fire their warhead(s) obliquely down onto the roof of the target.[45] This tactic holds great potential since the addition of armor to defeat it drives tank weight to unacceptable limits.

The final area of tank obsolescence proffered by the naysayers is the replacement of the main battle tank with a light tank. The premise of this argument is that as the ground force responds more frequently to threats at the middle or lower end of the conflict spectrum, a light tank, more deployable and offering a high degree of mobility and some firepower, provides the best solution. A whole array of wheeled armored chassis is available now, ranging from nine to 15 tons, that can provide crews protection against small arms and possibly heavier weapons. Advocates believe these vehicles, though not designed for heavy assault, can provide responsive and effective tactical mobility.[46] The victory of the Chadian Army, equipped with French armored cars and Japanese-built trucks firing ATGMs and surface-to-air (SAM) missiles, over a Libyan heavy armor force in 1987 is an example of the effectiveness of light, fast, mobile forces against a slower, more heavily armored force.[47]

THE TRADITIONALISTS

The opposing viewpoint is the main battle tank remains the decisive ground combat weapons system now and into the foreseeable future. For argument's sake, those holding this view are the "traditionalists". What follows is the rationale the traditionalists use to support their contention.

The end of the Cold War and the collapse of the Soviet Union forces the United States to reevaluate old strategies and focus on the new world situation. The challenge is to ensure the security of our national interests in an environment where threats are uncertain and conflict is both likely and unpredictable. The strategic nuclear force is not a credible deterrent against regional conflict. To be credible, one must believe that both the capability and the will to use that capability exist.

In the Post-Cold War period, stability and the deterrence of war are likely measured by the capabilities of conventional forces.[48] The U.S. must shift its focus from global deterrence of a single adversary on a regional basis to the regional deterrence of multiple actors on a global basis.[49]

There are three components of deterrence: (1) the capability to acquire and deploy forces able to carry out plausible military threats to retaliate; (2) credibility -- the declared intent and believable resolve to protect a given interest; and (3) communication -- relating to the potential aggressor,

unmistakably, the capability and will to carry out the deterrent threat.[50] These components continue to apply in the future.

For the most part there is always a mix of both nuclear and conventional force deterrence. As long as other nations possess nuclear weapons, the United States must also have them to ensure the credibility of its deterrent. The critical task is to assess the conventional force's ability to deter regional conflicts that may threaten U.S. vital interests.

Critics of conventional force deterrence argue it has not worked for the past 45 years and there is no reason to believe it will work now or in the future. The argument is not sound. First, the deterrent value of American weapons' technology and doctrine is at its zenith, far exceeding the capability of any potential adversary. Second, conventional forces now have many of the capabilities formerly ascribed only to nuclear strategic forces -- range, accuracy, survivability, and lethality. Third, over time, any form of deterrence fails. Accordingly, those failures provide the opportunity to demonstrate the price of aggression, rejuvenate the credibility of conventional deterrence, and establish a new period of stability.[51] Said another way, as conventional force becomes more lethal and more usable, it becomes more credible.

The conventional force deterrent strategy differs significantly from the Cold War nuclear deterrent strategy. To work, the conventional force must demonstrate its capability. The Gulf War provided the United States some leverage for the

near term, but an unwillingness to use the force, or a reluctance to declare that the force will be used, will quickly compromise its ability to influence the outcome in the future.[52]

So, while one might hope the Gulf War bestowed lasting credibility on conventional forces as a strategic deterrent, other points of view are possible. Some potential aggressors may perceive today's high-technology weapons as less punishing than their area-weapon predecessors, e.g., the comparatively widespread destruction from strategic bombing in Europe in World War II vice the relatively small damage produced by precision-guided munitions in Iraq.[53] Future adversaries may accept the risks if they believe the United States will respond with a scalpel rather than a mace. What say the traditionalists? The conventional force projections must address a wide range of potential conflict situations, from low-intensity contingencies to conventional warfare.[54] With upwards of 20 nations owning tank inventories of over 1000 main battle tanks, operations against heavy armor are likely. A plausible scenario follows.

First, the deploying force expects immediate combat action, likely against initially superior hostile forces equipped with many advanced weapons systems, including main battle tanks of former Soviet origin. Second, although employing superior forces, intelligence agencies can "read" these forces, making tactical or technological surprise unlikely. Third, the most crucial period of the deployment occurs when the rapid deployment

force begins to arrive in the contingency area, susceptible to enemy armor attacks.[55]

Thus, tanks will continue to exist in large numbers and remain an important element of military strength. Consequently, enemy tanks used in support of aggressive, if not hostile policies, are a concern. Their offensive employment will need to be deterred, and if necessary, countered by opposing tanks, which alone can meet them on equal terms and defeat them.[56]

Beyond a doubt the main battle tank plays a critical role in such a scenario. The MBT's ability to gain the advantage immediately upon employment directly impacts on the U.S. or coalition force buildup necessary for follow-on operations. Some pundits argue that the early deployment phase can be won by air power alone, particularly attack helicopter forces. Certainly a potent antitank platform, it is, however, vulnerable to air defense weapons. Attack helicopters cannot survive long enough on the conventional battlefield to do their job without ground forces. Future success in the contingency deployment business depends upon the timely arrival of tanks, that can take on enemy armor from the start, in concert with other antitank systems, such as fixed and rotary wing aircraft, as part of a combined arms team.[57]

The tank force provides the muscle to the deterrence equation. In 1939, the Poles had no credibility problem regarding their will to resist Germany. Their problem was a shortage of modern military muscle. Will may be more important

than muscle for deterrence, but it is not as reliable -- so, acquire the latter and hope for the former.[58]

The uncertain nature of conflict in the future demands flexibility. Major contingencies tend to occur in places where one cannot respond quickly and effectively, because it is there hostile forces have the greatest leeway to pursue outcomes inimical to American interests.[59] Balanced forces, designed both for deployment and employment, provide flexibility. The heavy component of this force mix, the tanks, must deploy both in the early deploying package, the crisis response force, and in the follow-on reinforcing element. Such apportionment of the heavy force provides security against enemy armor attacks upon the friendly lodgement and permits a secure environment for additional force buildup should the conflict escalate. Tanks can quickly stabilize an uncertain situation. The limiting factor for this capability is strategic lift.

The United States has an imbalance between its strategic mobility needs and capabilities.[60] A major argument, waged for several years and still not resolved, concerns the question of how much strategic lift is enough. Obviously, the change from a forward-based to a forward presence strategy changes the requirement.

In the National Defense Authorization Act of FY 1991, Congress mandated a new study of the nation's strategic lift requirements.[61] Recently completed, the Mobility Requirements Study (MRS) postulates several possible scenarios and the

attendant requirements for strategic lift based upon levels of risk the National Command Authority (NCA) will assume. The MRS identified the strategic mobility requirements for the future -- 1997 and beyond.

For the near term, the argument of how much lift is enough has little relevance concerning the best use of the lift available. The U.S. needs more sealift and airlift. However, the heavy force is not undeployable or ineffective with that now available. The number of fast sealift ships currently in service today is adequate to move an armored division. And, while sealift is slower than airlift, it delivers a sizable combat force, as an entity, faster than airlift.[62] Tailoring, or "packaging" tank units for deployment in organizational sets, when the developing contingency requires less than a full division, provides enhanced flexibility. Such a concept is applicable to air and sealift.

Traditionalists view the threat from improvements in antitank weapon technology as overrated. While potential adversaries may have parity with the United States in a few aspects of armor and anti-armor capability, and while they may employ the latest in antitank technology, they will not have broad parity relative to fully deployed tank or mechanized infantry units.[63] Barring a nuclear attack, tanks will not be killed en masse as were troops in the open who faced automatic weapons and concentrated artillery fires of earlier wars. Rather, tanks or small tank formations will probably face arrays

of antitank weapons of the types discussed previously, resulting in attrition losses.[64]

This tank/antitank debate is all very interesting, but one should remember that actions evoke reactions. Arguably, the primary reason to armor the tank to defeat antitank weapons is not to confer total survivability on the tank, but to impose a restriction on the enemy by raising the ante -- by forcing him to procure and support even more powerful antitank systems.[65] It is unlikely that present or future adversaries can both procure and support such sophisticated systems.

American forces over the last 40 years have engaged in low-intensity conflict more than any other form of warfare. The proliferation of tanks and heavy armor throughout the Third World and developing nations provides adequate evidence of their utility.

The grand old theorist of armored warfare, J.F.C. Fuller, did not ignore the employment of armor in conflicts short of full-scale war. He claimed armor could be most useful in policing the remote corners of the British Empire. He defined the armor functions within the combined arms team as finding, holding, hitting, protecting, and smashing.[66]

Tanks were employed in both Vietnam and Afghanistan. In Vietnam (admittedly somewhere on the continuum between low-intensity and conventional warfare), U.S. commanders initially believed the terrain was unsuitable for tanks. An analysis conducted during the war showed that 46 percent of the terrain

was trafficable to tanks the year round. By the end of the war, 24 percent of the combat maneuver battalions in Vietnam were either armor, armored cavalry, or mechanized infantry.[67] The Soviets employed seven motorized rifle divisions into Afghanistan in 1979, each containing a regiment of main battle tanks. Their effectiveness was a mixed bag. The tank and mechanized forces were successful in protect and hit missions; however, they could rarely fix or destroy with significant results.[68] In these conflicts, the tank/heavy force was effective when used in a combined arms approach and within recognized functional limits. The U.S. underestimated armor capability in Vietnam, and the Soviets overestimated it in Afghanistan.

A final word on low-intensity conflict and tanks. During Operation Just Cause in Panama, tanks participated, specifically Sheridan light tanks. In the words of a then airborne trooper "...when the steel flew, and the streets of Panama echoed to the crack of small arms fire, the common soldiers knew what they wanted: a TANK".[69]

The final argument of the traditionalists in support of tank utility is the MBT adaptability to an environment across the continuum of warfare. With their protective armor, mobility, and firepower, tanks are the ground weapon system with the highest probability of survival on the modern battlefield.[70] Tanks are effective at all levels of warfare because they operate successfully in the face of many antitank threats. The Gulf War

demonstrated it requires much effort and a high level of technology to defeat the modern MBT.

FINAL THOUGHTS

A person might look at a cloudless, brilliant blue sky and throw away his raincoat and umbrella. So might a nation assess its present-day security considerations and decide it does not need its military force structure, or it requires considerable change to reflect current requirements. Such action is imprudent in a constantly changing world. Long-term vision, rather than knee-jerk reaction to short-term possibilities, is essential.

In this context the following statement is made: the main battle tank, and with it, the resultant heavy armored force, remains an essential element of U.S. force structure. Main battle tanks retain value and utility in the post-Cold War National Military Strategy.

Several factors contribute to this conclusion. First, and likely foremost, no other ground system has the tank's enduring battlefield attributes: survivability, firepower, mobility, and flexibility. There is no tangible evidence indicating that the nature of warfare in the future will truncate the tank's effectiveness. Nations around the world continue building their ground combat forces around the main battle tank. One may argue the merit of these actions, however, the very fact that such is the case confers credibility to the forecast. The tank retains

great usefulness even with the demise of the Soviet Union. Many nations own many tanks, and not all of those nations have the same interests as the United States. Should conflict arise, the United States must act decisively. More often than not, an aircraft carrier battle group or Navy/Marine amphibious ready group cruising offshore can defuse a budding crisis. If that fails, air raids may do the job, hurting the enemy and demonstrating U.S. resolve. When bad goes to worse, and citizens or key geographic holdings are threatened, ground forces must go in -- fast and hard.[71]

Armored formations are the decisive land combat force. Some argue the attack helicopter is now preeminent in land combat. A reasoned argument is possible for this assertion. On balance, however, while the attack helicopter is an important part of the land combat combined arms team, it lacks the survivability and all-weather characteristics of the main battle tank. One recalls T.R. Fehrenbach's admonition:

> .....you may fly over a land forever; you may bomb it, atomize, pulverize it, and wipe it clean of life -- but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman legions did, by putting your young men into the mud.[72]

The second factor is the measure/countermeasure technology cycle. As long as the main battle tank remains the prime land combat weapon system, attempts to defeat it or render it ineffective with new or enhanced technology are constant. Such

is the process of conflict -- the better mousetrap syndrome. Through the years the tank withstood these assaults by incremental improvements to its on subsystems and capabilities, thus offsetting the antitank development. If one considers maneuver and firepower the dominant characteristics of ground warfare, then the MBT has operated and evolved in both areas, either using enhancements in one to counter antitank advances in the other or in the same area.

A word of caution concerning weapons technology. As the development and improvement pendulum swings between firepower and maneuver, one must carefully watch the length of time associated with those cycles. The trend over the last two decades or so indicates firepower growth, or improvements, occurring at a faster rate than maneuver enhancements. If the trend continues, MBT vulnerabilities will exist until the countermeasure cycle shortens. Additionally, in such a competitive environment, the United States cannot assume its capability and technological advantage will remain unchallenged and ignore the development process yielding this edge. In an era of increasingly constrained resources, it is attractive to think the current capability advantage will continue without routine investments in research and development. Such shortsighted views will not sustain this country's technological advantage.

The main battle tank is essential as the ground combat system providing credibility to conventional force deterrence. Ergo, the third factor of effectiveness. As stated previously, without

will and credibility, deterrence is a bankrupt concept. For conventional deterrence to be a viable concept, the conventional force must be sufficiently capable. Air forces provide that capability to an extent, however, air-delivered precision guided munitions, which reduce collateral damage, diminish the prospects of unacceptable losses to combatants. Such a situation may entice a potential adversary to try his hand.

The main battle tank -- the armored force -- the heavy division -- still provide the means to accomplish strategic objectives. The U.S. heavy division, flexible and agile, possesses an unmatched capability in the world today. Even the former Soviet Union admittedly rates the U.S. divisions far superior to their Soviet counterparts. The Soviet assessment was based on technical characteristics such as mobility, firepower, survivability, and command and control. The Soviets consider the U.S. tank division to have over twice the combat potential of their motorized rifle division. Additionally, the M1A1 tank was rated superior to the T80 Soviet main battle tank.[73] All of these factors contribute in various ways to the final one -- the face of battle as defined by what the American people will accept. In recent times the mandate is for short wars, low U.S. casualties, and decisive victory. Future conflicts will be fought to secure vital national interests. Strategic realities influence the military options; political and regional considerations require quick and decisive military action. With many countries having large armored forces, the intervening force must engage and

decisively defeat well-organized modern armies. Tank forces alone provide that capability, almost universally, to all environs. To fulfill the mandate from the American people, tank forces are essential.

The end game is a conventional force that not only deters, but when required, fights and wins quickly, decisively, and with minimum friendly casualties. The armored force provides such capability for land warfare. High technology, modernized tank forces capable of quick, decisive action shorten the conflict and reduce potential casualties.

So now, with a credible, viable, and effective tank/armored force, what are the implications on the National Military Strategy? What kinds of things must be done or at least thought about to accommodate the armored force in the crisis response world? To support the crisis response strategy, U.S. forces must quickly arrive in the crisis area, either forcibly or unopposed, prepared to conduct combat operations immediately upon arrival. Said differently, these forces must deploy and then employ. Getting to the crisis area, a fundamental issue, is first for discussion.

Deployment of the heavy forces usually becomes the centerpiece issue of any serious debate concerning tank force viability. At the heart of the issue is more than just getting the force there. What forces must be there immediately, the early deploying forces, and what forces follow on later, the later deploying forces, are the key issues.

The nature of the crisis determines the composition of the forces required. Command, control, communications, and information (C^3I) systems are in place supporting the National Command Authority (NCA) and the subordinate Unified Commands, permitting them to analyze and assess a developing situation concerning the forces they need. Accordingly, the mission analysis determines force composition and how rapidly the force must deploy. From this mission analysis, the NCA and the Unified Command's Commander in Chief (CINC) select the forces needed, and whether they are early deployers, late deployers, or some of each.

The problem for the heavy forces is the paucity of strategic lift to get there quickly in an existing organizational entity. Up to now, when one talks of employing an armored unit in a crisis response scenario, the discussion normally defaulted to a division-size element. Force planners must avoid this practice both now and in the future. The mission analysis determines needed forces and the timing for deployment. It is entirely plausible to deploy an armored element quickly by air as part of a light force, and then follow with the armor element's parent unit as a later deploying force.

Does such a concept mean that tank forces need restructuring? Not necessarily. A common sense approach must prevail. Because of the uncertain nature of regional conflicts and their propensity to flare up when least expected, heavy force sizing is difficult.

Early deploying heavy forces must possess the same level of readiness to deploy as the light forces. The heavy ready force, however, will likely be smaller than a corresponding light ready force it may deploy with and support. For both airlift and sealift, this concept prescribes packaging heavy forces to fit available strategic lift assets.

This concept results in a hierarchy of heavy force deployment options. For airlift, specific base packages provide a minimum capability. Augmentation or support packages, built to enhance the base package capability, can deploy depending on air frame availability. Such packaging provides great flexibility, allowing trade-offs between air frames and acceptable risk in the area of operations. For example, a CINC might face a potential armored threat after his light forces conduct a forced entry and lodgement. He may opt to allocate six of his C-5 airframes, strategic lift, to deploy a tank/mech team (4 MBT's, 4 infantry fighting vehicles, and 2 armored personnel carriers as command and control vehicles), getting an armor force on the ground quickly to counter. If he wants to enhance the armor unit's sustainability, the allocation of another C-5 provides additional fuel, ammunition, spare parts, and medical support. The same concept applies to larger size tank elements -- establish a base package and then a menu of other packages to enhance or sustain the base depending on the situation.

This concept also has application to the sealift of armor forces, though obviously on a grander scale. Planners will

develop a base package from the mission analysis, then design other packages to enhance the support of the base package. Since more lift space is available, more forces can move at the same time. Force enhancement modules, developed to enhance base unit capability or provide additional capability in combat support or service support areas, go with the base package. These modules allow the CINC to "round-out" the force with capabilities he cannot get into theater quickly with allocated airlift. Though admittedly slower in initial arrival time, the sealift advantage is earlier delivery of the unit as an entity.

To sum up, base packages of early deploying armor/heavy forces optimize available lift in response to an immediate tank/armor threat in the crisis area, accomodate force tailoring, and increase flexibility. Additional packages or modules enhance capability in combat support and combat service support areas.

Force redesign is not necessary since the packaging can be done from within existing unit structure, i.e., the division. Another option exists, however. This option is to restructure heavy divisions into heavy separate armor and mechanized brigades. Such restructuring will provide units that are tactically mobile and, importantly, more strategically deployable. The previously outlined "packaging" concept yields roughly the same end state, but the pre-deployment configuration remains at the division level. Restructuring into separate brigades is an attractive concept for early deploying heavy

forces. Also, any restructure is a zero sum game; any "growth" resulting from the change must be borne by the remainder of the heavy force. Separate brigade authorized strength figures abound, running from 4000 to 5400 soldiers. The current heavy division strength (approximately 16,000 soldiers) can support restructure into three separate brigades, with little left over after necessary combat support and service support falls in. A recent U.S. Army War College study concluded the separate brigade should be the corps commander's building blocks with which he would tailor his force.[74]

Follow-on heavy forces will deploy by sea in division sets. By this time in the deployment timeline, sealift to accommodate heavy divisions is available. Additionally, it is prudent to assume that the lodgement in the area of operations is secure and time is available to buildup heavy forces necessary for decisive operations. Though this is potentially the most serious scenario in terms of the magnitude of the conflict, it is also the least likely.

The prepositioning of equipment in the area of operations greatly aids the deployment process. Prepositioning, either on ships in the area or in land storage sites, reduces the early-on deployment risks. Prepositioned sets of equipment located on ships in different regions of the world provide quick response and tremendous flexibility. Initial prepositioning will likely be in brigade sets of equipment. Once land-based facilities increase or more prepositioned ships are available, these sets

can enlarge to division-level size. An armored threat to the lodgment requires early deploying armor units to counter. However, considerably more armored force can be on the ground much earlier by merely falling in crews to link-up with the prepositioned equipment.

How big should the heavy forces be? This is a complex and emotional area of discussion. The answers range from enough to defeat a resurrected Soviet Union to the other end of the spectrum -- none since the only threats are regional conflicts and those are low intensity in nature. Some purport sophisticated formulas based on the Persian Gulf War and "equivalent Iraqi Divisions," while others justify their numbers based on budget affordability alone.

The answer is enough heavy force to do the job and no more. Easily said but not quantifiable. If one harkens back to that person who on a sunny cloudless day throws away his raincoat and umbrella, maybe the answer is not so elusive. The burden of maintaining an armored force of adequate size to deter potential adversaries, and of keeping it trained and ready to fight quickly and win decisively should deterrence fail, is profound. To this writer, it seems that this is clearly what the nation requires of the Army. The challenge is the ability to do that given the resources allocated by Congress.

The active Army requires two and one-third armor or mechanized divisions to adequately support the crisis response strategy as early deploying forces. That number comes from a

cursory analysis of potential threats and their capabilities, and by applying that force against sealift available now and for the next five to seven years. This assumes one division deploys to draw prepositioned stocks, one deploys by fast sealift, and one-third, a regiment or brigade, deploys by some combination of air, sea, and prepositioning. Additionally, these units deploy as entire entities, thus achieving the combined arms synergism.

Upwards of three armor/mechanized active divisions will comprise later deploying, follow-on forces. Deployment of these forces will reinforce earlier deploying units, permit unit rotation during extended conflict, replace allied units should coalition warfare fail, or provide forces for concurrent regional conflicts.

The Reserve Components will also provide armor forces. Army Reserve or National Guard heavy combat units, company to brigade, cannot deploy in the time required of early deploying active force units. Thus, they will provide armor and mechanized units as later deploying forces. These heavy forces should be organized as separate heavy brigades rather than divisions. Such a realignment greatly enhances their ability to deploy quickly (90 days post-mobilization training for a brigade vice 360 for a division) and facilitates employment once in the theater. The logistics support for early deploying forces must, due to stringent timelines, come from the active forces. The Reserve Components will provide combat support and combat service support to and for later deploying active and reserve units.

No investigation concerning the viability of the tank is complete without some mention of the "light tank". What is a light tank and where does it fit in? Within U.S. doctrine, a light tank is a special purpose armored platform. The U.S. light tank is the M551 Sheridan Armored Reconnaissance/Airborne Assault Vehicle. It is, as its name implies, a special purpose lightly armored vehicle. It is found only in the Army's one airborne division.

In development and scheduled for fielding in 1994 is the replacement for the Sheridan, the Armored Gun System (AGS). A total of 300 vehicles will be produced pending budget revisions. In addition to replacing the Sheridan, the AGS will be fielded in the Army's Light Cavalry Regiment. Further fielding to other light forces and the training base will follow.

The AGS is not a main battle tank. The primary design differences are the AGS requirement for tactical aircraft deployability and its level of armor protection. The AGS, unlike the main battle tank, specifies a minimum requirement of crew protection against artillery, small arms, and light antitank weapons.[75]

Where does the AGS fit into the heavy force structure? As stated above, it is the replacement vehicle for the Sheridan, albeit with considerable capability enhancement. The replacement of the Sheridan with the AGS sustains the airborne division's strategic mobility, enhances its operational capability vis a vis improved lethality, and provides limited crew survivability

improvements. By outfitting a light cavalry regiment with AGS, the deployment of such a regiment provides enhanced strategic mobility and tactical flexibility, giving the force commander in the area of operations a better reconnaissance and security posture and improved support of dismounted operations until arrival of the in tank force.

One must take care in thinking that AGS is competitive with heavy armor. Not so. The AGS will not penetrate main battle tank frontal armor with its 100mm gun. This means the AGS squadrons/battalions will use the same tactics as the Sheridan against heavy armor -- attack the flanks and rear of the enemy force. The AGS armor will withstand artillery, small arms, and light antitank weapons, not enemy tank fire. Also, current plans preclude fielding it in sufficient numbers to compensate for its less-than-MBT survivability and less-than-optimal armor defeating capability.[76] All the more reason to maximize its capability through good tactical employment.

Regardless of the nature of future conflict, whether it is insurgencies and brush-fire wars, or like that seen in the Persian Gulf, no single weapon system will replace the main battle tank on the battlefields of the future. No other system carries the fight. to the enemy, in the face of heavy fire, like the tank. No other system known today or projected for tomorrow creates conditions for battlefield success -- and then exploits those conditions -- like the tank. These unmatched capabilities assure its preeminence for years to come.

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